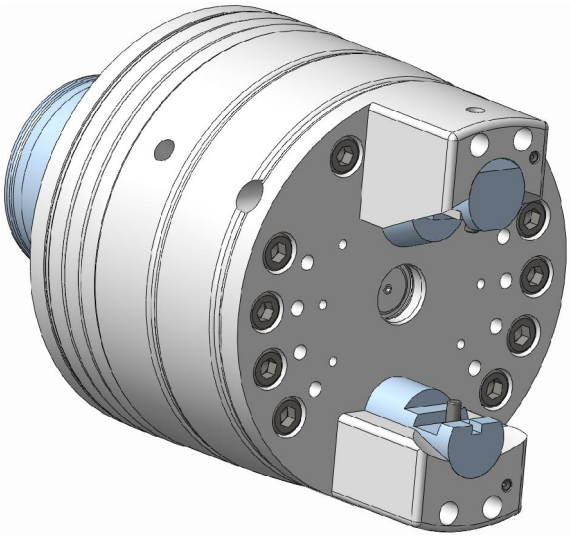
HAINBUCH
SPANNENDE TECHNIK



Installation manual

EN

Bolt chuck

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»Translation of original installation manual«

1 General

1.1 Information about this manual

This manual enables safe and efficient handling of the clamping device.

The manual is a component of the clamping device and must be kept in the immediate vicinity of the clamping device where it is accessible for personnel at all times. Personnel must have carefully read and understood this manual prior to starting all tasks. The basic prerequisite for safe work is compliance with all the safety instructions and handling instructions in this manual.

Illustrations in this manual are provided for a basic understanding and may deviate from the actual model of the clamping device.

It is assumed that the reader is familiar with standard procedures, such as cleaning the mounting surfaces.

1.2 Explanation of symbols

Safety instructions

Safety instructions are indicated by symbols in this operating manual. The safety instructions are introduced by signal words that express the scope of the hazard.

The safety instructions must be strictly adhered to, you must act prudently to prevent accidents, personal injury, and material damage.

DANGER

… indicates an imminent dangerous situation than can result in death or serious injury if it is not avoided.

WARNING

… indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.

CAUTION

… indicates a possible dangerous situation that can result in minor or light injury if it es not avoided.

NOTE

… indicates a possible dangerous situation that can result in material damage if it is not avoided.

Tips and recommendations

… indicates useful tips and recommendations, as well as information for efficient and trouble-free operation.

1.3 Limitations of liability

All information and instructions in this operating manual have been provided under due consideration of applicable standards and regulations, the current state of technology, as well as our many years of experience.

The manufacturer assumes no liability for damage due to:

- Failure to follow the instructions in the manual
- Non-intended use
- Deployment of untrained personnel
- Unauthorized conversions
- Technical changes
- Use of non-approved spare parts

The actual scope of delivery can vary from the explanations and graphic representations provided in this manual in the case of special versions, if supplemental order options are desired, or on the basis of the latest technical changes.

The agreed obligations in the delivery contract, the general terms and conditions, as well as delivery conditions of the manufacturer, and the statutory regulations valid at the time the contract was concluded, apply.

CAUTION!

Our clamping devices are balanced with balance quality G = 4, in one level n = 1.

The data on the rotation balance refers to rotationally symmetrical work pieces.

The clamping of not rotationally symmetrical work pieces may not be clamped and/or only be clamped after consultation with the manufacturer.

Balancing bolts and balancing weights at the clamping devices may not be removed / disassembled!

1.4 Max. RPM

CAUTION!

The maximum permissible RPM of the clamping device must be redetermined in every application case, on the basis of the clamping forces required for machining.

Of all RPMs of the groups specified, the **lowest given RPM** must always be used.

1.5 Copyright

This manual is protected by copyright and is provided exclusively for internal purposes.

Delivery of the operating manual to third parties, duplication in any form – including excerpts – as well as exploitation and/or communication of the content, are not permitted [except for internal use] without written approval from the manufacturer.

Actions to the contrary make damage compensation mandatory. We reserve the right to enforce additional claims.

1.6 Scope of delivery

All tools and accessories that are not included in the scope of delivery are marked as optional.

In scope of delivery of the clamping device:

- 1 Bolt chuck

Optionally the scope of delivery of the clamping device includes:

- Workpiece end-stop
- Eye bolts

1.7 Spare parts

WARNING!

Safety risk if the wrong spare parts are used!

Incorrect or defective spare parts can cause damage, malfunction, or total failure; they can also impair safety.

- Only use manufacturer's original spare parts.

Only purchase spare parts from authorized dealers or direct from the manufacturer. Addresses are in the appendix.

1.8 Warranty terms

The warranty terms are included in the manufacturer's terms and conditions.

2 Safety

This section provides an overview o fall the important safety aspects for optimal protection of personnel, as well as for safe and trouble-free operation.

2.1 Responsibility of the customer

The device is used in industrial applications. Consequently the owner of the device is subject to legal industrial safety obligations.

In addition to the safety instruction in this manual, generally valid safety and accident protection guidelines, and environmental protection guidelines must be adhered to and complied with for the area of implementation of the device.

WARNING!

Risk of injury!

Defective seals or incorrect hydraulic supply can cause serious personal injury.

- Hydraulic lines must be secured by the machine by check valves and a permanent pressure monitoring!

2.2 Personnel requirements

WARNING!

Danger of injury due to insufficient qualification!

Improper handling of the clamping device can cause serious injury or material damage.

- Only have activities performed by personnel who are qualified to perform these activities.

The following qualifications are cited in the operating manual for the various activity areas.

- **Specialized personnel**
  are personnel who due to their specialized training, skills, and experience, as well as knowledge of the applicable regulations, are capable of executing the tasks assigned to them and of recognizing and avoiding possible hazards on their own.
- **Hydraulic specialist**
  The hydraulic specialist has been trained for the particular task area in which he is active and is familiar with the relevant standards and regulations. Due to his specialized training and experience the hydraulic specialist can perform tasks on hydraulic equipment and recognize and avoid possible dangers on his own.
- **Electric specialist**
  The electric specialist has been trained for the particular task area in which he is active and is familiar with the relevant standards and regulations.
  Due to his specialized training and experience the electric specialist can perform tasks on electric equipment and recognize and avoid possible dangers on his own.

Only persons from whom it can be expected that they reliably execute their work are considered as personnel. Persons whose capability to react is impaired, for instance through drugs, alcohol, or medication, are not approved.

- Comply with age-specific and job-specific regulations that are applicable at the installation site when selecting personnel.

2.3 Intended use

The clamping device is designed for installation in a machine tool according to CE compliant. Within the machine tool the clamping device is designed exclusively as a through-bore chuck for bar work and / or as an end-stop chuck for chuck work.

The clamping device should only be mounted, operated, maintained, and cleaned by instructed, specialized personnel.

Intended use also includes compliance with all the instructions in this manual.

The clamping device is to be used for the case of application contractually agreed between the producer/deliverer and the user, as well as such cases of application described in the product description which are also in accordance with the technical values.

The safe function of the clamping device is, as far as it can be foreseen, guaranteed when it is used for the intended purpose in accordance with the appropriate safety regulations.

Any use that extends beyond the intended use, or any other use of the clamping device is considered to be misuse and can cause dangerous situations.

WARNING!

Danger due to misuse!

Misuse of the clamping device can cause dangerous situations.

Particularly refrain from the following uses of the clamping device:

- Use in machines other than machine tools.
- Use in machine tools with technical data other than that specified on the clamping device.

Claims of any type due to damage arising from non-intended use are excluded.

Unintended and improper use of the Power Chuck is for example

- If workpieces are not clamped properly
- If safety regulations are disregarded and persons are working at the clamping device without additional protective devices e.g. for machining.
- If the clamping device is used for machines or tools for which it is not intended.

2.4 Personal protective equipment

Wearing of personal protective equipment is required to minimize health hazards when working with the device.

- Always wear the protective equipment necessary for the respective task when working with the device.
- Follow the instructions that have been posted in the work area.

Always wear

For all tasks always wear:

Protective work clothing

is tight-fitting work clothing with low resistance to tearing, with tight sleeves, and without projecting parts. It is primarily used to protect against entanglement by moving machine parts.

Do not wear rings, chains, or other jewelry.

Safety footwear

for protection against heavy falling parts and slipping on slippery substrates.

For special tasks wear

Special protective equipment is required when executing special tasks. Separate reference is made to this equipment in the specific sections of this manual. This special protective equipment is explained below:

Hard hat

to protect against falling and flying parts and materials.

Protective goggles

to protect eyes from flying parts and liquid splashes.

Protective gloves

to protect hands from friction, abrasion, puncture wounds, or deeper injuries, as well as from contact with hot surfaces.

2.5 Special dangers

In the following section residual risks are cited that occur due to installation of the clamping device in a machine tool. In each case the residual risks that have been determined based on a risk analysis of the machine must be specified by the customer.

- Follow the safety instructions listed here and the warnings in the other sections of this manual to reduce health hazards and to avoid dangerous situations.

Horizontal / lying parts

WARNING!

Danger of injury due to horizontal parts!

Before transporting the clamping device in horizontal condition:

- Put the clamping device on a non-slip pad
- Screw in the eye bolts

Suspended loads

WARNING!

Life-threatening danger due to suspended loads!

Some clamping devices must be lifted with a crane. When lifting the clamping device there is a life-threatening hazard due to falling parts or parts swinging out of control.

- Never step under suspended loads.
- Comply with the instructions concerning the intended attachment points. Ensure that the sling gear is securely seated!
- Do not attach lifting gear in projecting components.
- Only use approved hoists and sling gear with sufficient bearing capacity.
- Do not use rope and belts that are torn or frayed.

Moving parts

WARNING!

Danger of injury due to moving parts!

Rotating parts of the clamping device can cause serious injuries.

- Do not reach into moving parts or handle moving parts during operation.
- Note the gap dimensions of moving parts.
- Do not open covers when the device is in operation.
- Be aware of afterrun time:
  Prior to opening the covers ensure that all parts have come to a standstill.
- Wear tight-fitting protective work clothing in the danger zone.

Wrong clamping of the work piece

WARNING!

Danger of injury due to incorrect clamping of the work piece!

Incorrect work piece clamping may lead to the ejection of the work piece and result in serious injuries.

Under dimensioned (tolerance) parts can lead to incorrect clamping!

- Check the unmachined work pieces at random on dimensional accuracy.

Too low supply pressure can lead to the reduction of clamping force!

Too high supply pressure can lead to damage of the components of the clamping device!

- Check and adjust, if necessary, the supply pressure regularly.
- Do random checks of the unmachined work pieces on dimensional accuracy.

Missing changing parts

WARNING!

Danger of injury due to missing changing parts!

When operating the clamping device without changing parts [segmented clamping bushing, clamping heads, work piece end-stops] there is a higher danger of crushing injuries due to the stroke of movable components of the clamping device.

- The clamping process may not be initiated without assembled segmented clamping bushing and/or work piece end-stop.

Parts with sharp edges

WARNING!

Risk of injury!

When screwing in individual components such as for example work piece end-stops, threaded adapters and similar devices that are equipped with an external thread or wear caused by burrs, there is risk of cutting.

- The operation must be done only by qualified personnel.
- Wearing of gloves / [PSA] is required!

CAUTION!

Risk of injury!

A special use-dependent or job-based design can result in variations in the clamping strokes and thus the clamping force.

- The notes on the associated clamping situations or product drawing must always be observed

2.6 Further warnings

WARNING!

Risk of injury!

Never reach for the clamping device while the spindle is rotating. Before starting to work on the mandrel, make sure the machine spindle cannot be put in motion.

WARNING!

Risk of injury!

Falling down of the clamping device or its parts can cause severe bruises and fractures.

The dead weight of the clamping device or its parts can lead to high physical stress.

WARNING!

Risk of injury!

Missing o-rings or seals may cause severe injuries!

Due to missing / fallen out O-rings and seals compressed air or hydraulic fluids which are under high pressure may expel!

- Make sure that all O-rings / seals for the hydraulic / pneumatic connections are available and undamaged!
- If necessary lubricate them before assembly and/or during service.

WARNING!

Risk of injury!

By repeated reworking or wear and tear of the clamping surfaces sharp edges and burrs may appear and lead to severe cutting damages.

WARNING!

Damage of clamping device!

The clamping device may be released exclusively in the standing condition!

2.7 Clamping force

The achieved clamping force can vary due to the maintenance condition of the clamping device [state of lubrication and degree of contamination] [see chapter »Maintenance«].

The clamping force must be checked at regular intervals. This requires the use of static clamping force measuring devices.

CAUTION!

Damages due to excessive draw and compressive force!

An excessive draw force and/or compressive force may damage the clamping device.

- The max. draw force and compressive force may not be exceeded.

2.8 Screws

Moving parts

WARNING!

Danger of injury due to screws and stud screws being accelerated out of the device!!

Screws and stud screws radially attached to the product can be accelerated out of the device and cause severe injuries.

- At the product radially mounted screws and stud screws which were loosened for assembly and maintenance must be re-tightened with the correct tightening torque!
- The tightening torque is shown in the assembly drawing of the product or it is engraved on the device itself in the direct vicinity of the screw or stud screw.
- All screws or stud screws that are not marked with a tightening torque specification are tightened with the prescribed tightening torque and locked [medium-strength bonding] in the factory and should only be unscrewed after consultation with the manufacturer. If in doubt you must contact the manufacturer immediately do determine the subsequent procedure.

2.9 Functionality

NOTICE!

With high contamination of the clamping device the functionality is no longer guaranteed.

- The cleaning and maintenance intervals must be observed.

2.10 Environmental protection

NOTE!

Environmental hazard due to incorrect handling!

Incorrect handling of environmentally hazardous substances, particularly improper disposal, can cause significant environmental damage.

- Always comply with the instructions cited below
- If environmentally harmful substances should inadvertently get into the environment, initiate suitable measures immediately. If in doubt notify the responsible municipal authority about the damage.

The following environmentally harmful substances are used:

Lubricants

Lubricants like greases and oils can contain toxic substances. Ensure that they do not get into the environment.

The device must be disposed of by a specialized disposal company.

To achieve trouble-free operational performance of the clamping device only use HAINBUCH lubricants. See the appendix for reference addresses.

3 Technical data

3.1 General information

The bolt chuck is available in different sizes and variants.

Information about e.g.

- dimensions
- weight

you will find in the following table and/or on the corresponding drawing that you can order at HAINBUCH.

Size / Clamping device	Weight [kg]	Dimensions [ø x length in mm]	Spindle flange connection [ø in mm]	Speed max. [1/min]	Clamping force F_{rad} max. [kN]	Clamping force F_{ax} max. [kN]
80 A020937.0001C	29	ø 180 x 186	IP 140	1600	40	25
32 A013517.0008C	14	ø 140 x 185	KK 5	5000	5	1,5

IP = inner fit dimensions / KK = short taper size

F_{rad} max. can only be reached in lubricated condition.
In unlubricated condition F_{rad} max. is much lower.

WARNING!

Risk of injury!

Using false technical data can lead to serious personal injury and property damage.

- The technical data [label on the product, assembly drawing] must be observed and may not be modified by the operator!

3.2 Operating conditions

Environment	Specification	Value	Unit
	Temperature range	15 - 65	°C

Mechanical actuating	In each possible operating condition the maximum draw force and compressive force may not be exceeded!

3.3 Power specifications

NOTE!

Material damage if the power specifications do not agree!

If the power specifications of clamping device, machine adapter and machine do not agree, severe damage extending to total damage can occur.

- Only operate clamping devices and adapters in machines with the same power specifications.

Information on maximum clamping force and draw tube force is provided on the clamping device and the adapter.

3.4 Dimensional sheet

Dimension sheets for the respective product can be requested from HAINBUCH.

3.5 Type designation

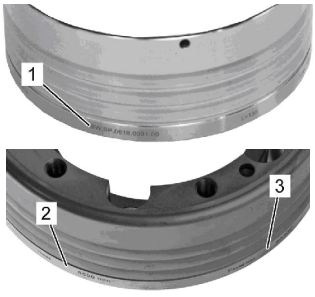


Fig. 1

The type designation is on the product and includes the following information:

1 ID no. [marked with the # symbol]
2 Maximum speed [rpm]
3 Maximum clamping force [kN]

4 Structure and function

4.1 Overview

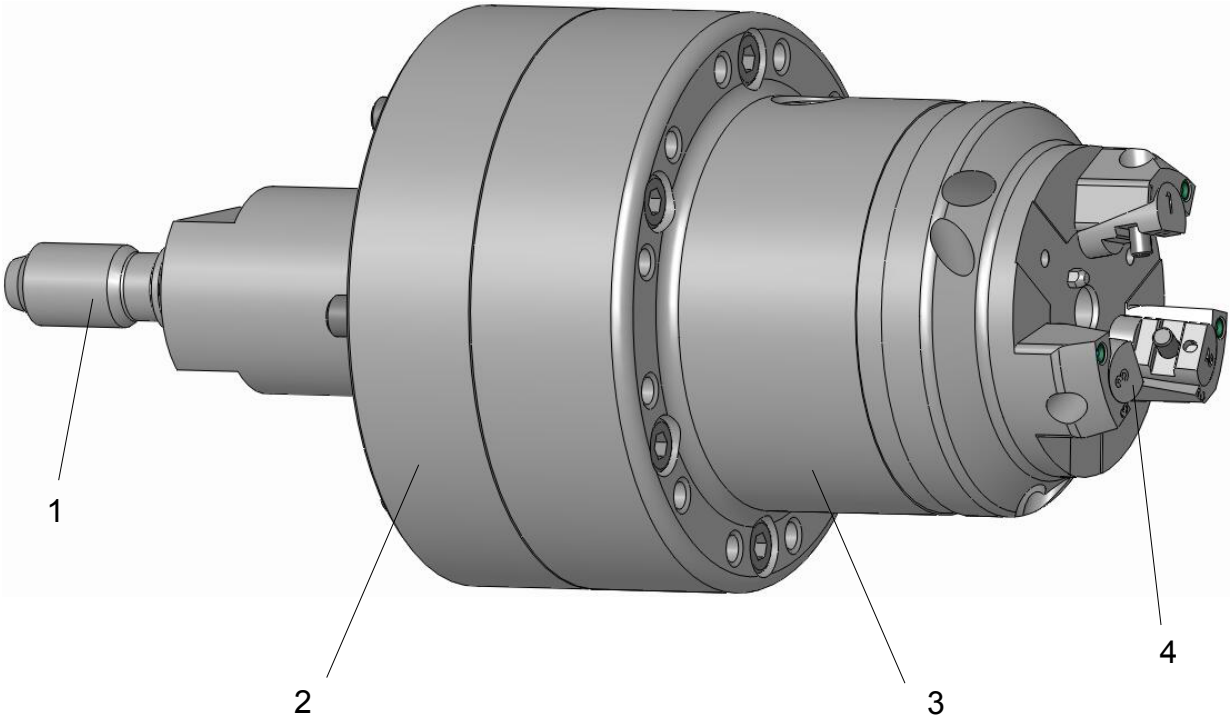


Fig. 2

1. Adapter
2. Spindle flange
3. Clamping device
4. Changing parts

4.2 Optional Accessories

The accessories described here are not included in the scope of delivery.

Specially developed segmented clamping bushings match to the respective maximum RPM are available for each clamping device. Trouble-free and precise function of HAINBUCH clamping devices is only ensured when using original HAINBUCH segmented clamping bushings.

Lubricating grease and grease gun are required for cleaning and preservation of the clamping device. The lubricating grease is also specially matched for protection of the vulcanized segments of the segmented clamping bushings and increase their service life and elasticity by a significant factor.

4.2.1 Work piece end-stop

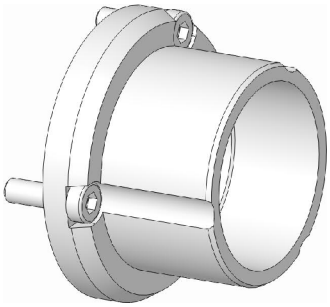


Fig. 3

The work piece end-stop is manufactured with a end-stop dimension according to the customers request. In combination with the segmented clamping bushing and the segmented mandrel it provides a functional unit.

4.2.2 Grease

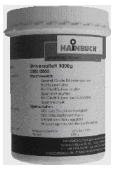


Fig. 4

The universal grease for chuck and mandrel lubrication is supplied in a 1000g can. The order number for the universal grease is 2085/0003; it can be ordered from HAINBUCH.

4.2.3 Grease gun

Fig. 5

The grease gun is filled with universal grease, which is pressed into the clamping device. The grease gun has a pointed mouthpiece. The order number for the grease gun is 2086/0004; it can be ordered from HAINBUCH.

5 Transporting, packaging, storing

5.1 Safety instructions for transporting

Unbalanced package

WARNING!

Danger of falling due to an unbalanced package

Packed goods can have an unbalanced package. If attached incorrectly the package can tip and cause life-threatening injuries.

- Note the markings on the packages.
- Attach the crane hook in such a manner that it is located above the center of gravity.
- Carefully lift and see if the load tilts. If necessary change the attachment.

Transport!

- For transport always use a suitable clamping means / crane.
- Make sure that a rolling / falling of the clamping device is not possible.

5.2 Symbols on the packaging

Fragile

Identifies packages with fragile or sensitive contents.
Handle the packed goods with care; do not allow them to fall, and do not subject them to impact.

Protect from moisture

Keep packed goods dry and protected against moisture.

5.3 Transport inspection

Check delivery immediately upon receipt to ensure that delivery is complete and to identify any transport damage.

Proceed as follows it there is apparent external damage:

- Do not accept the delivery, or only accept it with reser-

vation.

- Note the extend of transport damage on the transport documents or on the transport company's delivery ticket.
- Submit a complaint.

Report any defect as soon as it is detected. Claims for damage compensation can only be enforced during the applicable periods for giving notice of lack of conformity.

5.4 Unpacking and inner-company transportation

The clamping device is packed vertically and has threaded bores in the end face.

From about weight 15 kg there are also threaded holes in the circumference of the clamping device. Lifting eye bolts can be screwed into these threaded holes.

For transporting with transport trolley the clamping device must be positioned in standing condition. Make sure that a non-slip pad has been laid.

To safely lift the clamping device out of the package it must be hooked into a crane depending on the weight.

All tools and accessories which are not in scope of delivery are marked as optional in the operating instructions.

- Two people are required for this task.
- Special tools required:
  - Crane from weight more than 15 kg
  - Lifting eye bolts

1. Screw lifting eye bolt into the thread in the end face of the clamping device.
2. Hook the load-handling equipment into the lifting eye bolt.
3. Use a crane to carefully lift the clamping device out of the transport packaging and put it down on a stable, level substrate.

5.5 Packaging

About the packaging

Individual packages are packed according to the expected transport conditions. Environmentally-friendly materials have been used exclusively for the packaging.

Packaging should protect the specific components from transport damage, corrosion, and other damage until installation. Therefore do not destroy the packaging, remove it just before installation.

The packed goods are sealed in foil airtight and packed in cartons. See the »Technical Data« section for the specific weight of the respective sizes.

Handling packaging materials

Dispose of packaging materials in accordance with the respectively valid statutory regulations and local guidelines.

NOTE!

Improper disposal causes environmental damage!

Packaging materials are valuable raw materials and in many cases they can be reused, or they can be effectively treated and recycled.

- Dispose of packaging materials in an environmentally responsible manner.
- Comply with locally applicable disposal guidelines. If necessary commission a specialized company to dispose of packaging.

5.6 Storing

Under certain circumstances instructions for storage and subsequent storage are affixed to the packages that extend beyond the requirements cited here.
Comply with these instructions accordingly.

Storage of packages

Only store packages under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free location
- Do not expose to aggressive media
- Protect from direct sunlight
- Avoid mechanical vibration
- Storage temperature: 15 bis 35 °C
- Relative humidity: max. 60 %
- For storage periods longer than 3 months:
  - Check the general condition of all parts and the packaging at regular intervals.
  - Touch up or re-apply anti-corrosion agents as needed

Subsequent storage of the clamping device

Only re-store the clamping device under the following conditions:

- Thoroughly clean the clamping device prior to subsequent storage [see section »Cleaning«]
- Thoroughly oil and grease the clamping device. [see section »Cleaning«]
- Store the clamping device in airtight foil
- The clamping device must be stored securely in position. If this is not guaranteed, use a suitable container for the clamping device or equip the shelf with a circumferential securing edge.

6 Assembly

WARNING!

During the initial installation of the clamping device severe injuries may occur.

- The initial installation must be done only by qualified personnel.
- All screws remaining in the clamping must be tightened firmly.
- All tools and keys must be removed after installation.

WARNING

Risk of injury due to stored energy!

The clamping device can be designed with disc springs. These disc springs are under permanent tension! The release of the stored energy can cause injuries!

- By loosening the corresponding screws they have to be operated continuously alternately to reduce the clamping pressure to a minimum!
- Particularly cautious approach is required!
- For cleaning and maintenance disassemble the clamping device from the machine!
- Always wear personal protective equipment!

6.1 Pre-consideration

- Screws are tightened according to the size of the screw and the general torque.
  To avoid axis-parallel warpage under load and to get stiffness turn in the screws evenly.
- To avoid precision error clean the screw joint surfaces and also the mating surfaces, see »Maintenance«.
  The ex works wetting of the plate surfaces and the clamping element is only corrosion protection. It's not functionally lubricated.
- The insertion of lubricant is provided only on the mechanical surfaces. Pay attention to the instructions for lubricants in the chapter »Maintenance«.
- Avoid too much lubricant on the bearing surface, as this can cause face runout.
- Seal rings (e.g. o-ring, quad-ring seal) and sealing surfaces must be lubricated.
  Note the information in the chapter »Maintenance«.
- Note that the function surfaces (plate surface, mating surface, cone surface and seal surface) may not be damaged.

CAUTION!

Wear safety shoes during the assembly and maintenance work.

Make sure that the starting of the spindle is impossible.

6.2 Preparations

The total weight of the clamping device, consisting of spindle flange and clamping unit, depends on the size and can be as much as 30 kg.

Depending on the weight, to safely lift the clamping device out of the package and position it in the machine it must be hooked into a crane.

WARNING!

Danger of injury due to falling components!

When mounting components can fall and cause severe injury and material damage.

- Two people are always required for this task.
- Use a crane.

Damages caused by dirty surfaces!

Dirty contact surfaces and scratches can lead to reduced run-out and concentricity.

- Clean the contact surfaces and lubricate them lightly.
- Check the bearing surfaces for scratches or other damage. If necessary. contact the manufacturer.

6.2.1 Preparing the bolt chuck with permanent tension

Special tools required:

- Allen wrench
- Oil stone
- Crane from weight 15 kg
- Eye bolts from weight 15 kg

NOTE!

For transport always use a suitable clamping means / crane and the delivered eye bolts.

- Make sure that the eye bolts will be removed after assembly and before start-up and machining!

The clamping device is delivered in assembled condition.

1. Remove the clamping device out of the transport box by using the eye bolts.

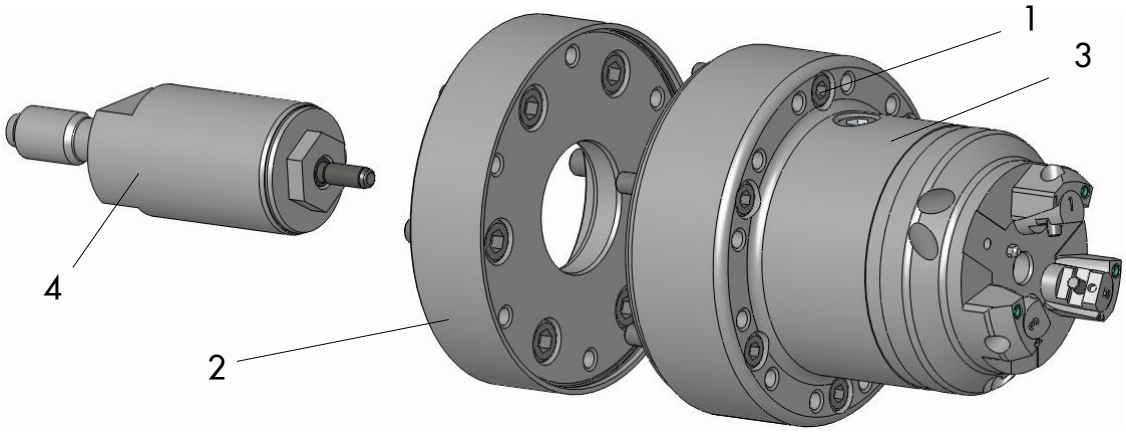


Fig. 6

2. Unscrew the adapter [4] together with the media supply out of the clamping device.
3. Loosen and remove all cylindrical screws [1] from the clamping unit [3] by using an allen wrench.
4. Lift the clamping element reception off of the spindle flange.
5. Wipe off the mating surfaces on the spindle flange and clamping unit with a soft, lint-free cloth and remove all oil and grease residues.
6. Hone the mating surfaces on the spindle flange with an oil stone.

6.2.2 Preparing the bolt chuck without permanent tension

Special tools required:

- Allen wrench
- Oil stone
- Crane from weight 15 kg
- Eye bolts from weight 15 kg

NOTE!

For transport always use a suitable clamping means / crane and the delivered eye bolts.

- Make sure that the eye bolts will be removed after assembly and before start-up and machining!

The clamping device is delivered in assembled condition.

1. Remove the clamping device out of the transport box by using the eye bolts.

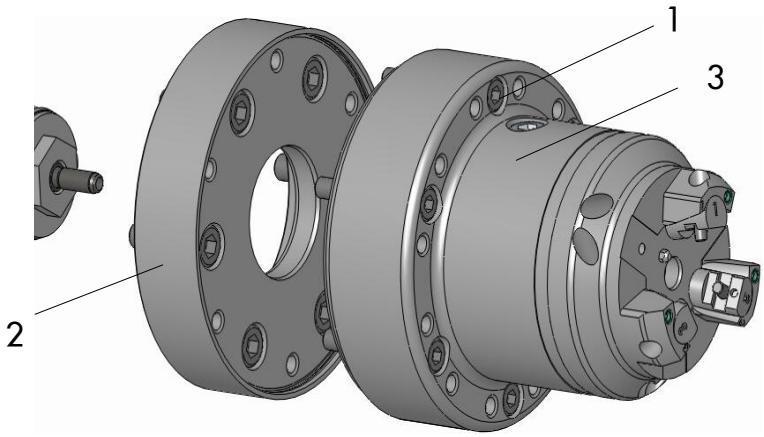


Fig. 7

2. Loosen and remove all cylindrical screws [1] from the clamping unit [3] by using an allen wrench.
3. Lift the clamping element reception off of the spindle flange [2].
4. Wipe off the mating surfaces on the spindle flange and clamping unit with a soft, lint-free cloth and remove all oil and grease residues.
5. Hone the mating surfaces on the spindle flange with an oil stone.

6.3 Assembling of the clamping device

WARNING!

Danger of injury due to unintentional start-up of the tool spindle!

Unexpected start-up of the tool spindle can cause severe injury.

- Prior to switching on automatic mode close all protective doors or hoods that are present on the machine tool.
- Unscrew all eye bolts from the clamping device and remove them from the interior of the machine.
- Only run the machine in set-up mode or jog mode.

WARNING!

Risk of injury!

By operating the clamping device without changing parts [clamping head, segmented clamping bushing, work piece end-stops ...] there is an increased risk of crushing injuries by the stroke of the moving components of the clamping device.

By uncontrolled discharge of the clamping process [e.g. by incorrect installation of the energy supply or faulty programming] there is an increased danger.

WARNING!

Risk of injury!

Bending in the working area of the machine can cause severe head injuries!

Risk of injury!

Contamination of the mechanism can influence/reduce the stroke, thus the clamping force is reduced and thus, the work piece is not properly tightened and can be thrown out.

- Clean the product regularly [see chapter »Maintenance and service«].

Risk of injury!

If the clamping pressure is too low clamped work piece may be thrown out.

If the clamping pressure is too high severe damages of the components of the clamping device may occur the throwing out of the work piece.

- Before operation set the operation pressure back to operation level.
- The operating pressure should be checked and adjusted regularly!
- The dimension of the work pieces should be checked regularly [clamping-ø]!

CAUTION!

Risk of injury!

Unexpected start up of the tool spindle can cause severe injury.

- Make sure that the system is pressure-free and that a restart of the machine can be excluded!

Transport!

- For transport always use a suitable clamping means / crane.
- Make sure that a rolling / falling of the clamping device is not possible.

WARNING!

Danger of injury due to vertical suspended spindle!

Bending into the machine work are when assembling overhead can cause severe head injuries.

- Secure components prior to overhead assembly.
- For assembly on a vertically suspended spindle always use a suitable mounting aid.

6.3.1 Assembly of the adapter [optional]

When assembling a bolt chuck with permanent tension, an adapter has to be assembled before the flange.

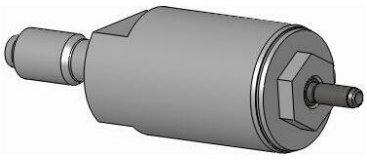


Fig. 8

1. Move the drawtube of the machine into front end position [release position].
2. Screw the adapter [possibly together with the media supply] into the machine till end.

6.3.2 Assembling the flange [optional]

NOTE!

Material damage due to wrong tightening torque of the allen screws in the spindle flange!

The tightening torque of the allen screws is prescribed by the spindle or machine manufacturer. Incorrect tightening torque of the allen screws in the flange can cause significant material damage on the clamping device and on the machine.

- Only tighten the allen screws of the spindle with the torque prescribed by the spindle or machine manufacturer.

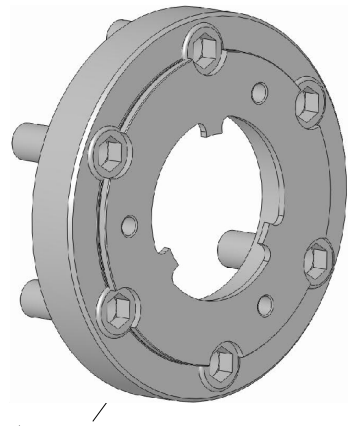


Fig. 9

1. Put the machine in set up mode.
2. Wipe off the mating surfaces of the machine spindle with a soft, lint-free cloth and remove all oil and grease residues.

NOTE!

Position the spindle flange [3] by the positioning pin at the machine spindle and the positioning hole at the spindle flange.

3. Place the spindle flange [3] on the machine spindle.
4. Screw in the cylindrical screws [4] through the flange [3] into the machine and tighten them only finger-tight.
5. Check the concentricity at the inner fit of the flange [optimum ≤ 0.005 mm], correct if necessary carefully with a plastic hammer.
6. 6. Tighten the cylindrical screws [4] firmly with the correct tightening torque, see »Maintenance«.

6.3.3 Assembly of the bolt chuck without permanent tension

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Eye bolts

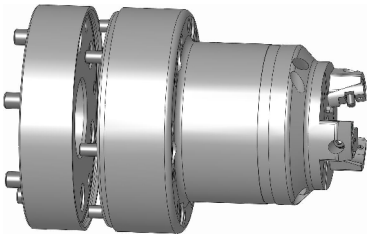


Fig. 10

1. Put the machine in set up mode.
2. Remove all tools from the interior of the machine.
3. Set the clamping pressure of the machine tool on the lowest setting.
4. Screw the clamping device into the drawtube of the machine till end stop.
5. Turn back the clamping device anti-clockwise till the bolt hole circles for the cylindrical screws are align.
6. Screw in the cylindrical screws and tighten them only finger-tight.

6.3.4 Assembly of the bolt chuck with permanent tension

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Eye bolts

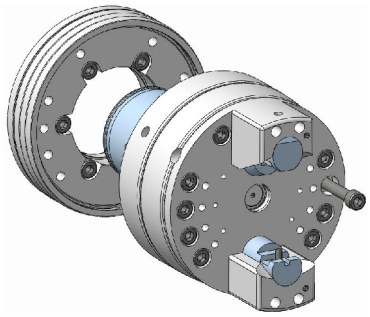


Fig. 11

1. Put the machine in set up mode.
2. Remove all tools from the interior of the machine.
3. Set the clamping pressure of the machine tool on the lowest setting.
4. Put the clamping device on the pre-assembled flange. Screw the clamping device on the media supply till end stop.
5. Turn back the clamping device till the bolt hole circles of clamping device and spindle flange are align.
6. Screw in the cylindrical screws and tighten them only finger-tight.

WARNING!

Crushing danger due to machine movement!

Due to the design of the draw tube it may not always be avoided that in the assembly of draw tube adapter and the clamping unit / clamping device there is a gap between machine and clamping device.

Crushing danger, that can cause severe injury.

- Never reach into the gap between machine / spindle flange and clamping device!

6.3.5 Checking and adjusting the face run and the concentricity

NOTE!

Material damage due to insufficient face run and concentricity!

Due to insufficient face run and concentricity work pieces can be damaged during processing.

- After each mounting check, and if necessary re-adjust, the face run and concentricity of the clamping device.

Checking face run

Special tools required:

- Dial indicator
- Plastic tip hammer

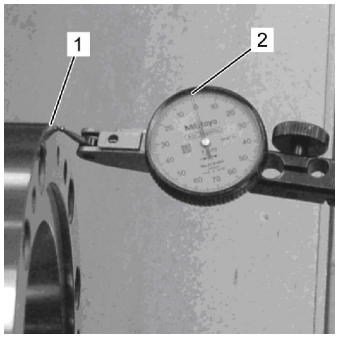


Fig. 12

1. Place the magnetic base of the dial indicator on the inside of the machine.
2. Place the dial indicator for face run on the face of the clamping unit.
3. Use a plastic tip hammer to carefully knock the clamping unit into position.

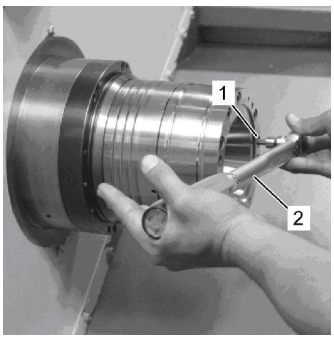


Fig. 13

4. 4. Tighten the cylindrical screws with a torque wrench in a cross pattern [see section »Screw tightening torque«].

For exact adjustment, if necessary loosen the allen screws several turns and re-tighten in a cross pattern.

5. 5. Wipe off the taper of the the clamping element reception with a soft, lint-free cloth and remove all oil and grease residues.

Checking concentricity

Special tools required:

- Dial indicator
- Plastic tip hammer
- Torque wrench

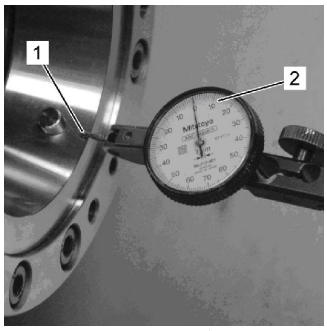


Fig. 14

1. Place the magnetic base of the dial indicator on the inside of the machine.
2. Place the dial indicator for concentricity on the clamping taper.
3. Adjust the clamping device in such a manner that the dial indicator shows the value »0«.

For exact adjustment, if necessary loosen the allen screws several turns and re-tighten in a cross pattern.

6.3.6 Assembly of the workpiece end-stop

Special tools required:

- Allen wrench

The assembly of the workpiece end-stop to the clamping device differs between bolt chuck with and without permanent tension.

Without permanent tension

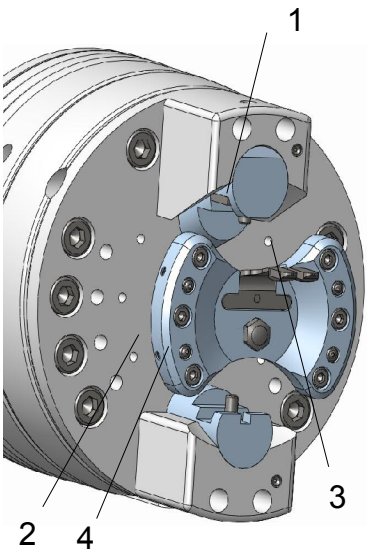


Fig. 15

1. Move the drawtube of the machine into rear end position [clamping reserve].

   The cylindrical screw [1] may only be actuated in clamping reserve!

2. Put the workpiece end-stop [2] into the clamping device.

   The clamping levers [3] must be aligned to the sloping bolts!

3. Screw in the cylindrical screws [4] and tighten them firmly with the correct tightening torque, see »Maintenance«.

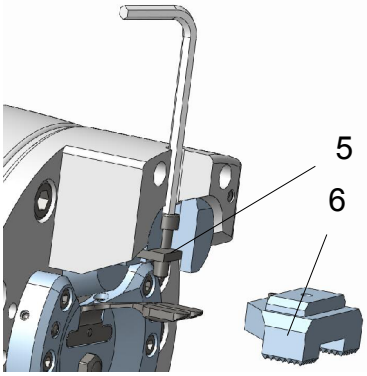


Fig. 16

The spacer discs [5] are for balancing the fluctuation tolerances of the different workpiece charges [workpiece blanks]!

Risk of injury!

If the clamping pressure is too low clamped work piece may be thrown out.

- Make sure that to each batch the appropriate spacer disk is used!

For positioning use the cylindrical pin at the clamping jaw and the positioning groove at the sloping bolts.

4. Put the clamping jaw [6] into the clamping device at the sloping bolt.
5. Screw in the cylindrical screw [5] into the clamping jaw [6] by using the allen wrench [SW5] and tighten it firmly.

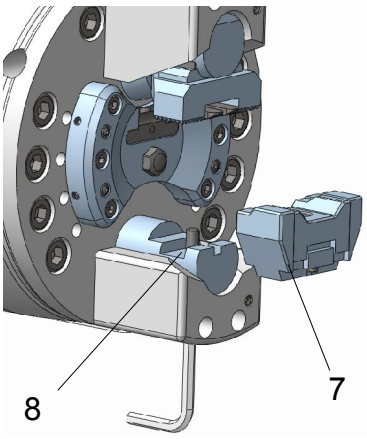


Fig. 17

6. Put the clamping jaw [7] into the clamping device at the sloping bolt.

   For positioning use the cylindrical pin at the clamping jaw and the positioning groove at the sloping bolts.

7. Screw in the cylindrical screw [8] into the clamping jaw [7] by using the allen wrench [SW5] and tighten it firmly.

With permanent tension

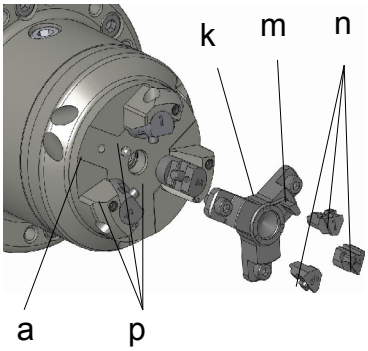


Fig. 18

1. Move the drawtube of the machine into release position.

   The pin [a] is used for the orientation of workpiece end-stop [k] on the clamping device.

2. Put the workpiece end-stop [k] on the clamping device.
3. Screw in the cylindrical screws [m] and tighten them firmly.
4. Insert the clamping elements [n] according to the engraved numbers. Screw in the cylindrical screws [p] and tighten them firmly.

WARNING!

Risk of injury!

Tools and gages that are thrown out of the machine can cause injury.

- Remove all tools and gages from the working area of the machine before the machine is started up.

Risk of injury!

If the clamping pressure is too low clamped work piece may be thrown out.

If the clamping pressure is too high severe damages of the components of the clamping device may occur the throwing out of the work piece.

- Before operation set the operation pressure back to operation level.
- The operating pressure should be checked and adjusted regularly!

WARNING!

Slipping danger due to escaping hydraulic fluid!

Escaping (sprayed out) hydraulic oil can cause serious injuries.

- Make sure that all o-rings/seals for the hydraulic / pneumatic interfaces are available and in undamaged condition.
- Make sure that the clamping device is empty and leakage of hydraulic fluid is avoided.

6.4 Work piece

WARNING!

Risk of injury due to thrown out parts!

During clamping of the work piece and the processing parts can be thrown and cause severe injuries and property damage.

- Check the clamping diameter of the work piece.
- Tighten only work pieces that meet the dimensional requirements.
- For clamping very long work pieces use in addition a tailstock / a steady rest for support.
- Do not exceed the maximum clamping pressure.
- Make sure that the correct supply pressure [neither too high nor too low] is set.

CAUTION

Risk of injury!

When placing the work piece:

- Make sure that the hands / fingers may not be clamped between the flange and the work piece!

6.5 Inspections

NOTE!

Material damage due to damaged clamping devices!

A damaged, incomplete, or unbalanced clamping device can significantly damage or even destroy the machine tool and the work piece.

- Only install undamaged, complete, and precisely balanced clamping devices.
- If in doubt contact the manufacturer.

Ensure the following points prior to each installation and start-up of the clamping device:

- All allen screws of the clamping device must be present and tightened with the proper tightening torque.
- The balance screws of the clamping device must all be present and undamaged.
- All rubber segments must be intact; this means that they are neither torn, nor are they porous at any point.
- All edges and bearing surfaces are intact; this means that they are neither broken nor do they show any signs of wear.
- The set speed of the machine tool should not exceed the maximum permissible speed of the clamping device.
- The maximum draw tube force specified on the perimeter of the clamping device must not be exceeded.
- The clamping pressure of the machine must be sufficiently high.
- All mounting tools must be removed from the interior of

the machine.

- Clamping device and work piece must be compatible – check the clamping diameter regularly.
- The work piece must be clamped into the clamping device with sufficient work piece tension.
- Do a pressure loss test and a measurement of clamping force.

6.6 Control of the stroke position

WARNING!

Crushing danger from moving parts!

Crushing danger from moving parts during controlling the stroke position!

Gaps, caused while controlling the stroke position, can cause severe injury.

- Only do the controlling of the stroke position with assembled changing parts.
- Only run the machine in set-up mode or jog mode.

6.7 Activities after production is concluded

1. Move the clamping device into unclamped position.
2. Switch off the machine tool and safeguard it from being switched on again.
3. Open the protective door or hood.
4. Clean the clamping device of chips and production residues with a soft, lint-free cloth.
5. Close the protective door or hood.

7 Disassembly, subsequent storage, disposal

If there is break in production that lasts longer than 3 days, the clamping device must be disassembled and properly stored in accordance with the manufacturer's specifications [see section »Transport, packaging, storage«].

Prior to disassembling:

- Put the machine in set up mode.
- Remove fuels and auxiliary materials, as well as residual processing materials and dispose of these items in an environmentally-responsible manner.

7.1 Safety

Safeguarding against restart

DANGER!

Life-threatening danger if restarted without authorization

When disassembling there is danger of the energy supply being switched on inadvertently. This poses a life-threatening hazard for persons in the danger zone.

- Prior to starting the tasks switch off all energy supplies and safeguard them from being switched on again.

WARNING!

Danger of injury due to falling components!

When mounting components can fall and cause severe injury and material damage.

- Two people are always required for this task.
- Use a crane.
- For assembly on a vertically suspended spindle always use a suitable mounting aid.

WARNING

Risk of injury due to stored energy!

The clamping device can be designed with disc springs. These disc springs are under permanent tension! The release of the stored energy can cause injuries!

- By loosening the corresponding screws they have to be operated continuously alternately to reduce the clamping pressure to a minimum!
- Particularly cautious approach is required!
- For cleaning and maintenance disassemble the clamping device from the machine!
- Always wear personal protective equipment!

WARNING!

Danger of injury due to vertical suspended spindle!

Bending into the machine work are when assembling overhead can cause severe head injuries.

- Secure components prior to overhead assembly.
- For assembly on a vertically suspended spindle always use a suitable mounting aid.

7.2 Disassembling the clamping device

7.2.1 Disassembly of the workpiece end-stop

Special tools required:

- Allen wrench

The disassembly of the workpiece end-stop from the clamping device differs between bolt chuck with and without permanent tension.

Without permanent tension

1. Move the drawtube of the machine into rear end position [clamping reserve].
2. Loosen and remove the cylindrical screw [8] from the clamping jaw [7] by using an allen wrench [SW5].
3. Remove the clamping jaw [7] from the clamping device.

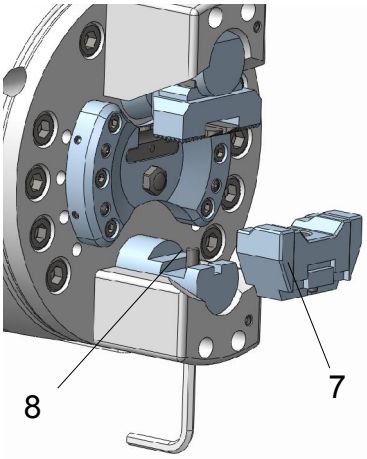


Fig. 19

4. Loosen and remove the cylindrical screw [5] from the clamping jaw [6] by using an allen wrench [SW5].
5. Remove the clamping jaw [6] from the clamping device.

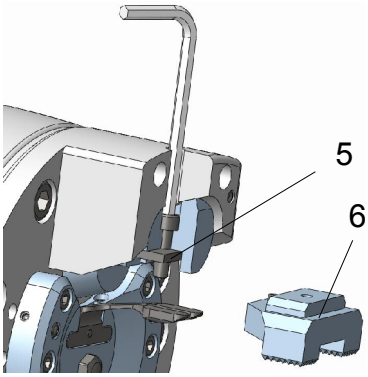


Fig. 20

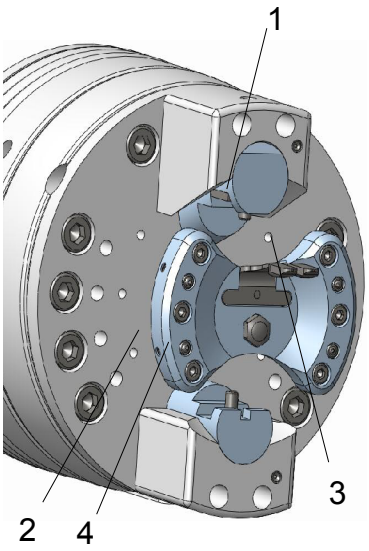


Fig. 21

The cylindrical screw [1] may only be actuated in clamping reserve.

6. Loosen and remove the cylindrical screws [4].
7. Remove the workpiece end-stop [2] from the clamping device.

With permanent tension

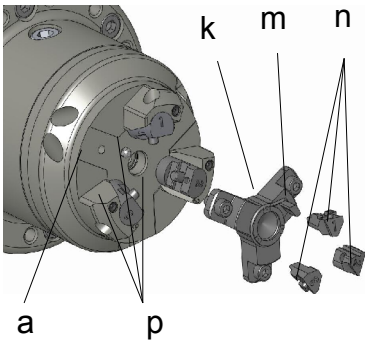


Fig. 22

1. Move the drawtube of the machine into release position.
2. Loosen and remove the cylindrical screws [p].
3. Remove the clamping elements [n].
4. Loosen and remove the cylindrical screws [m].
5. Remove the workpiece end-stop [k] from the clamping device.

7.2.2 Disassembly of the bolt chuck [without permanent tension]

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Eye bolts

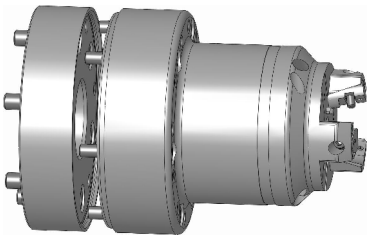


Fig. 23

1. Put the machine in set up mode.
2. Remove all tools from the interior of the machine.
3. Set the clamping pressure of the machine tool on the lowest setting.
4. Loosen and remove the cylindrical screws.
5. Unscrew the clamping device from the machine.

7.2.3 Disassembly of the bolt chuck [with Permanentspannung]

Two people are required for this task!

Special tools required:

- Allen wrench
- Crane
- Eye bolts

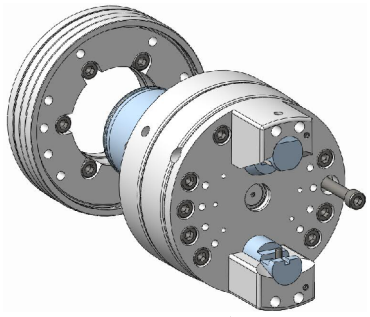


Fig. 24

1. Put the machine in set up mode.
2. Remove all tools from the interior of the machine.
3. Set the clamping pressure of the machine tool on the lowest setting.
4. Loosen and remove the cylindrical screws.
5. Remove the clamping device from the flange.

7.2.4 Disassembly of the flange

Two people are required for this task!

Special tools required:

- Allen wrench

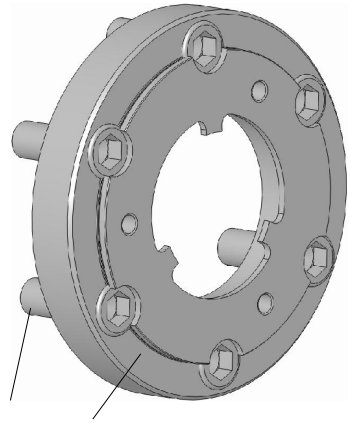


Fig. 25

1. Put the machine in set up mode.
2. Wipe off the mating surfaces of the machine spindle with a soft, lint-free cloth and remove all oil and grease residues.
3. Place the clamping device with the flange down.
4. Loosen and remove the mounting screws [4].
5. Remove the clamping device from the flange.

Damages caused by dirty surfaces!

Dirty contact surfaces and scratches can lead to reduced run-out and concentricity.

- Clean the contact surfaces and lubricate them lightly.
- Check the bearing surfaces for scratches or other damage. If necessary. contact the manufacturer.

7.2.5 Disassembly of the adapter [optionally]

When disassembling a bolt chuck with permanent tension there is a additional adapter.

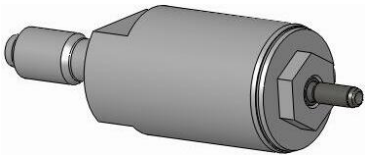


Fig. 26

1. Move the drawtube of the machine into front end position [release position].
2. Unscrew the adapter [possibly together with the media supply] out of the machine.

7.3 Subsequent storage of the clamping device

The clamping device must be cleaned and treated with corrosion protection for subsequent storage [see section »Cleaning«].

NOTE!

The storage conditions are specified in the section »Transport, packaging and storage«.

7.4 Disposal

If a return or disposal agreement has not been concluded, then recycle disassembled components.

CAUTION!

Risk of injury due to leaking fluids!

Hydraulically or pneumatically operated clamping devices may contain residues of liquids. Uncontrolled leakage of fluids can lead to severe injuries.

- Open the pressure relief screw and drain remaining liquid.
- Discard the liquid.

NOTE!

Improper disposal causes environmental damage!

Lubricants and other auxiliary materials are subject to treatment as special waste, and should only be disposed of by approved specialist companies!

NOTE!

Composite materials!

For disposal clamping devices which include composite materials [mineral cast, CFK] must be returned at HAINBUCH!

Local municipal authorities or specialized disposal companies provide information on environmentally-responsible disposal.

8 Maintenance

Environmental protection

Comply with the following instructions for environmental protection when performing maintenance work:

- At all lubricating points where lubricant is applied by hand, remove escaping, used, or excess grease, and dispose of it in accordance with applicable local regulations.
- Collect used oil in suitable containers and dispose of it in accordance with applicable local regulations.

8.1 General

Cleanliness of the appropriate end-stop as well as the guidance diameters are conditions for reaching the concentricity and perpendicularity tolerances. Clean these surfaces with an appropriate cleaner.

CAUTION

Danger of injury due to improper handling of cleaners!

Improper handling of cleaners can cause health impairments.

- Always comply with the safety data sheets and guidelines provided by the manufacturer of the cleaning agent for handling/using the cleaners.

CAUTION

Danger of injury due to loss of clamping force!

Fouling of the clamping device can cause the clamping device to lose considerable clamping force.

- Always comply with the maintenance and cleaning intervals specified in this manual.
- In conjunction with the maintenance intervals, regularly check the maintenance status of the clamping device through clamping force measurements.

NOTE!

Material damage due to use of the wrong cleaning agent/cleaner!

Seals and clamping elements can be damaged due to use of the wrong seals and clamping elements.

- Do not use any solvents that contain ester or polar solvents for cleaning purposes.

Risk of injury!

Slipping while the lubricating with a grease gun can lead to severe cuts!

WARNING

Risk of injury due to stored energy!

The clamping device can be designed with disc springs. These disc springs are under permanent tension! The release of the stored energy can cause injuries!

- By loosening the corresponding screws they have to be operated continuously alternately to reduce the clamping pressure to a minimum!
- Particularly cautious approach is required!
- For cleaning and maintenance disassemble the clamping device from the machine!
- Always wear personal protective equipment!

8.2 Cleaning

NOTE!

Material damage if cleaned with compressed air!

Cleaning the clamping device with compressed air can force metal chips into thread and grooves. This can damage or even destroy the clamping device.

- Never clean the clamping device with compressed air!

- Auxiliary material required:
  - Ester-free, non-polar cleaning agent
  - Soft, lint-free cloth

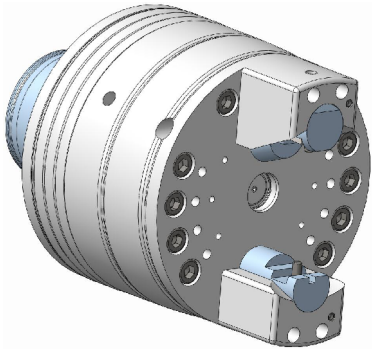


Fig. 27

1. Disassemble the clamping device [see section »Disassembling the clamping device«].
2. Clean all the components listed below with cleaning agent and a cloth; remove all oil and grease residues:
   - Flange
   - Clamping device
   - Cylindrical screws

8.3 Preservation

- Special tools required:
  - Universal grease 2085/0003
  - Grease gun
  - Oil stone
  - Soft, lint-free cloth

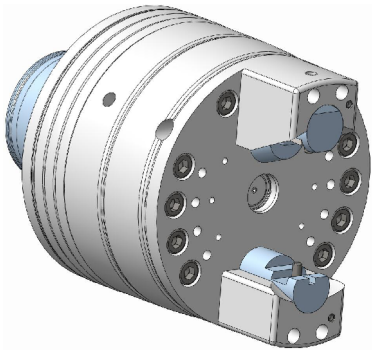


Fig. 28

1. Hone all the bearing surfaces of the clamping device with an oil stone.
2. Lightly grease all allen screws. Remove excess grease with a cloth.
3. Screw all allen screws into the clamping device again and tighten them hand tight.

   ! For subsequent storage tightening the allen screws hand tight suffices. This facilitates re-commissioning and protects the allen screws.

4. Lightly grease all interior and outer surfaces of the clamping device. Remove excess grease with a cloth.
5. Pack the clamping device airtight in foil. Place it on a level, impact-free storage location and safeguard it from falling.

8.4 Use of lubricant

With the usage of lubricant you may only use grease that corresponds to the requirements concerning bond, pressure-stability and solubility in lubricating coolant.
In addition no dirt particles may be in the grease; they cause run errors if they come in in-between two mating surfaces.
We recommend for this the following lubricant:

HAINBUCH grease

see product information

Alternatives:

Lubricant	Manufacturer	Product
Universal grease	MicroGleit	GP 355
	Klüber	QNB 50
	Zeller & Gmelin	DIVINOL SD24440
	Bremer & Leguill	RIVOLTA W.A.P.
Special grease	Klüber	MICROLUBE GL 261

8.5 Maintenance schedule

Maintenance tasks are described in the sections above that are required for optimal and trouble-free operation.

If increased wear is detected during regular inspections, then reduce the required maintenance intervals according to the actual indications of wear.

Contact the manufacturer, [see the service address on the back] if you have questions concerning maintenance tasks and intervals.

Interval	Maintenance task
daily	A general visual inspection, particularly at the clamping area and the end-stop face, is to be done to ascertain early damages at the clamping device and at the rubber of the clamping element. Complete cleaning in case of heavy contamination [see section »Cleaning«]
Each 20 operating hour	Clean the clamping device [see section »Cleaning«]
	Clean the clamping cone [see section »Cleaning«]
	Grease the clamping device [see section »Preservation«]
If necessary	Service by the manufacturer

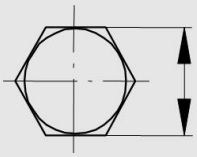
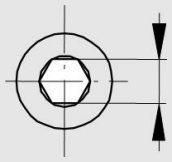
! For proper operation of the coolant feed a prefiltering with duplex filter (mesh size 100 µm, PI 3754] is necessary. The duplex filter is mounted on the coolant cleaning system.

8.6 Bolt torque

Metric ISO thread

The guide values for bolt tightening torque for achieving the highest permissible pre-tension for metric ISO thread are specified in Nm in the table.

- Total friction coefficient μ_{tot} = 0,12
- 90% utilization of the apparent limit of elasticity

Diameter	 [mm]	 [mm]	Torque for screw quality 10.9 [Nm]
M 4	7	3	4
M 5	8	4	7
M 6	10	5	12
M 8	13	6	25
M 10	17	8	50
M 12	19	10	100
M 16	24	14	220
M 20	30	17	400
M 24	36	19	600

The table shows the maximum permissible values and does not include any other safety factors. Knowledge of the applicable guidelines and configuration criteria are the prerequisites.

9 Trouble shooting

Possible fault causes and the tasks to correct these faults are described in the following section.

If faults occur more frequently, the maintenance intervals must be shortened to correspond to the actual system load.

Contact the manufacturer if there are faults that cannot be corrected by following the instructions below; see the service address on the back of this operating instruction.

9.1 Safety

Trouble shooting

The following always applies:

1. For faults that pose a direct danger for personnel and or property immediately execute the emergency-stop function.
2. Determine the cause of the fault.
3. If correction of the fault requires work in the danger zone, put the machine in set-up mode.
4. Immediately inform the responsible parties at the installation site of the fault.
5. Depending on the type of fault, either have authorized specialized personnel correct the fault, or correct it yourself.

   The trouble shooting table provided below lists personnel who are authorized to correct the fault.
6. If there is a fault that was not caused by the clamping device the cause of the fault may be in the machine area. See the operating manual for the machine in this regard.

9.2 Trouble shooting table

Fault	Possible cause	Fault correction	Corrected by
Clamping force is too low	Defective clamping mechanism	Contact the machine manufacturer	Machine manufacturer
	Spring force reduces	Compression spring loses force	Machine manufacturer
Marks on the clamping surface	Point or linear workpiece clamping	Replace with a clamping jaw that has a smoother clamping surface	Specialist
Formal defect on the work piece	Elastic deformation of feedstock that is subject to formal defects. After machining, the work piece returns to its original form.	Use feedstock with fewer formal defects. Use clamping jaws with several sharp teeth in the clamping surface.	Specialist

9.3 Start-up after corrected fault

After correcting the fault execute the following steps to start up again:

1. Reset the emergency-stop device
2. Acknowledge the fault on the machine tool controller
3. Ensure that no one is in the danger zone
4. Start the machine tool

10 Appendix

10.1 Service Hotline

Order Hotline

Quickly ordered and delivered. A call is all it takes:
+49 [0]7144. 907-333

Schedule Hotline

Current status of your order? Just call:
+49 [0]7144. 907-222

24h emergency call

Has there been a crash or other technical emergency?
Our experts are at your service around the clock:
+49 [0]7144. 907-444

10.2 Representatives

The sales partners and service employees listed below are available for further consultation or support.

Overview of German postal codes:

Mi	010 – 049	Si	350 – 369	Hen	560 – 569	Rt	730 – 739	Fs	880 – 899
Sl	060 – 089	Bs	370 – 399	Re	570 – 599	Ti	740 – 749	Sb	900 – 919
Mi	090 – 189	Ft	400 – 479	Si	600 – 659	He	750 – 799	Hs	920 – 949
Wt	190 – 289	Bo	480 – 499	Ti	660 – 699	Hs	800 – 819	Sb	950 – 969
Bs	290 – 319	Ft	500 – 549	Rt	700 – 709	Gg	820 – 829	Si	970 – 978
Bo	320 – 339	Hen	550 – 559	Rt	710 – 719	Hs	830 – 859	Ti	979
Bs	340 – 349	Si	400 – 479	Fs	720 – 729	Gg	860 – 879	Sl	980 – 999

10.2.1 Germany

Bo
Werner Bock KG
Commercial Agency
Neue Reihe 2
DE-33699 Bielefeld
Phone +49 [0]521. 92458-0
Fax +49 [0]521. 92458-99
E-Mail: bockkg@gmx.de
Internet: www.werner-bock-kg.de

Bs
Bock & Strothmann GmbH
Commercial Agency
Berliner Allee 49
DE-30855 Langenhagen-Godshorn
Phone +49 [0]511. 781068
Fax +49 [0]511. 782960
E-Mail: vertrieb@bockundstrothmann.de
Internet: www.bockundstrothmann.de

Fs
Uwe Fischer
Sales Representative
HAINBUCH GMBH
Im Apfentäle 25
DE-72525 Münsingen-Auingen
Phone +49 [0]7144. 907-662
Fax +49 [0]7381. 183783
E-Mail: uwe.fischer@hainbuch.de

Ft
Jörg Fedtke
Sales Representative
HAINBUCH GMBH
Kunkelsberg 2
DE-45239 Essen
Phone +49 [0]7144. 907-661
Fax +49 [0]201. 2463-839
E-Mail: joerg.fedtke@hainbuch.de

Gg
Winfried Gogg
Sales Representative
HAINBUCH GMBH
Kantstr. 16
DE-88471 Laupheim
Phone +49 [0]7144. 907-673
Fax +49 [0]7144. 907-872
E-Mail: winfried.gogg@hainbuch.de

Hb
HAINBUCH GmbH
Spannende Technik
Erdmannhäuser Straße 57
DE-71672 Marbach
Phone +49 [0]7144. 907-333
Fax +49 [0]7144. 18826
E-Mail: verkauf@hainbuch.de

He
Thomas Helfer Industrievertretung
Commercial Agency
Gerwigstraße 4
DE-76437 Rastatt
Phone +49 [0]7222. 916231
Fax +49 [0]7222. 916240
Mobil +49 [0]171. 2032559
E-Mail: helfer.industrievertretung@t-online.de

Hen
Anika Hensen
Sales Representative
HAINBUCH GmbH
Mühlenberg 15
DE-53902 Münstereifel
Phone +49 [0]7144. 907-675
Fax +49 [0]7144. 18826
E-Mail: anika.hensen@hainbuch.de

Hs
Thomas Hummel
Sales Representative
HAINBUCH GMBH
Pfarrer-Hopp-Straße 1
DE-93142 Pirkensee
Phone +49 [0]7144. 907-674
Fax +49 [0]7144. 907-874
E-Mail: thomas.hummel@hainbuch.de

Mi
Henry Miersch
Sales Representative
HAINBUCH GMBH
Feldstraße 51
DE-06917 Jessen
Phone +49 [0]7144. 907-664
Fax +49 [0]3537. 200455
E-Mail: henry.miersch@hainbuch.de

Re
Ulrich Remmel
Commercial Agency
Gildestraße 18
DE-58791 Werdohl
Phone +49 [0]2392. 9383-0
Fax +49 [0]2392. 9383-17
E-Mail: info@remmel.de
Internet: www.remmel.de

Rt
Renee Reuter
Sales Representative
HAINBUCH GMBH
Brühlstraße 7
DE-73252 Lenningen
Phone +49 [0]7144. 907-670
Fax +49 [0]7026. 371871
E-Mail: renee.reuter@hainbuch.de

Sb Benjamin Schuh
Sales Representative
HAINBUCH GMBH
Am Erlengraben 39
DE-91459 Markt Erlbach
Phone +49 [0]7144. 907-672
Fax +49 [0]7144. 907-872
E-Mail: benjamin.schuh@hainbuch.de

Si Michael Simon
Sales Representative
HAINBUCH GMBH
Am Tannenberg 8
DE-63776 Mömbris
Phone +49 [0]7144. 907-667
Fax +49 [0]6029. 994932
E-Mail: michael.simon@hainbuch.de

Sl Jörg Schlag
Sales Representative
HAINBUCH GMBH
Martin-Drucker-Straße 21
DE-04157 Leipzig
Phone +49 [0]7144. 907-665
Fax +49 [0]341. 24689012
E-Mail: joerg.schlag@hainbuch.de

Kp Thomas Klumpp
Technical Consultant
HAINBUCH GMBH
Hahnbergweg 15
DE-72270 Baiersbronn
Phone +49 [0]7144. 907-663
Fax +49 [0]7144. 291131
E-Mail: thomas.klumpp@hainbuch.de

Ti Jörg Tittel
Technical Consultant
HAINBUCH GMBH
Wunnensteinstraße 10
DE-71711 Steinheim/Murr
Phone +49 [0]7144. 907-668
Fax +49 [0]7144. 819864
E-Mail: joerg.tittel@hainbuch.de

Wt Werkzeug-Technik-Nord
Commercial Agency
Emmy-Noether-Str.1
DE-24558 Henstedt-Ulzburg
Phone +49 [0]4193. 8891780
Fax +49 [0]4193. 88917888
E-Mail: wtn@wtn-gmbh.de

Za Carsten Zander
Technical Consultant
HAINBUCH GMBH
Friedrich-Ebert-Straße 9
DE-31848 Bad Münder
Phone +49 [0]7144. 907-669
Fax +49 [0]5042. 506751
E-Mail: carsten.zander@hainbuch.de

10.2.2 Europe

Austria
GGW Gruber & Co. GmbH
Kolingasse 6
1090 Vienna
Phone +43 [0]1. 3107596-0
Fax +43 [0]1. 3107596-31
E-mail: ggw@gruber-ing.at
Internet: www.gruber-ing.at

Belgium
BIS Technics bvba/sprl
Zevenputtenstraat 20
3690 Zutendaal
Phone +32 89518890
Fax +32 89518899
E-mail: info@bistechnics.com
Internet: www.bistechnics.com

Czech Republic, Slovakia
TMC CR s.r.o.
Masná 27/9
60200 Brno
Phone +420 548214572
Fax +420 548217219
E-mail: info@tmccr.cz
Internet: www.tmccr.cz

Estonia, Latvia, Lithuania
DV-Tools OÜ
Peterburi tee 34/4
11415 Tallinn
Phone +372 6030508
Fax +372 6030508
E-mail: info@dv-tools.ee

France
HAINBUCH France SNC
Equipements de machines-outils
ZI Lons-Perrigny
1600, Route de la Lième
39570 Lons-le-Saunier
Phone +33 384876666
Fax +33 384876677
E-mail: info@hainbuch.fr
Internet: www.hainbuch.com

Great Britain
HAINBUCH UK Ltd.
Newberry
Keys Business Village, Keys Park Road
Hednesford, Staffordshire
WS12 2HA
Phone +44 1543 478710
Fax +44 1543 478711
Mobile +44 7980212784
E-mail: nick.peter@hainbuch.co.uk
Internet: www.hainbuch.com

Hungary
GGW Gruber & Co. GmbH
Kolingasse 6
1090 Vienna
Phone +43 [0]1. 3107596-0
Fax +43 [0]1. 3107596-31
E-mail: ggw@gruber-ing.at
Internet: www.gruber-ing.at

Denmark
Jørn B. Herringe A/S
Ramsømagle
Syvvejen 31
4621 Gadstrup
Phone +45 46170000
Fax +45 46170001
E-mail: sales@jbh-tools.dk
Internet: www.jbh-tools.dk

Finland
Oy Maanterä Ab
PL 70 Keinumäenkuja 2
01510 Vantaa
Phone +358 29006130
Fax +358 290061130
E-mail: maantera@maantera.fi
Internet: www.maantera.fi

France
Representative for: Haute Savoie
Utilis France Sarl
597, Avenue du Mont Blanc
74460 Marnaz
Phone +33 450963630
Fax +33 450963793
E-mail: contact@utilis.com
Internet: www.utilis.com

Greece
PAPET Papadopoulos GbR
Hauptstraße 75
DE-73061 Ebersbach/Fils
Phone +49 71635858/530668
Fax +49 716352265
E-mail: paris@papet-technologies.de

Ireland
Machine Shop & Engineering Supplies Ltd.
11 Vale View Lawn - The Park
Cabinteely, Dublin 18
Phone +353 12847003
Fax +353 12857955
E-mail: machshop@indigo.ie

Italy
HAINBUCH Italia srl
Via Caduti di Nassiriya 5
22036 Cantu [Co]
Phone +39 0313355351
Fax +39 031611570
E-mail: info@hainbuchitalia.it
Internet: www.hainbuchitalia.it

Norway
Onstad Maskin A/S
Chr. H. Blomsgt. 13
3717 Skien
Phone +47 35532373/74
Fax +47 35532375
E-mail: postmaster@onstadmaskin.no
Internet: www.onstadmaskin.no

Romania
Banatech srl
Carasului Str. 26
325400 Caransebes
Phone +40 255517175
Fax +40 355814125
Mobile +40 749220553
E-mail: office@banatech.ro
Internet: www.banatech.ro

Slovakia
NS s.r.o.
Vácka ulica 4109/10
01841 Dubnica N/V
Phone +421 424450873
Fax +421 424440406
E-mail: tns@tnssro.sk
Internet: www.tnssro.eu

Spain, Portugal
ATM Asistentes Tecnologicos del
Mecanizado, S. L.
Isaac Albeniz, 29
08402 Granollers [Barcelona]
Phone +34 938606572
Fax +34 938791689
E-mail: atm.sl@atmbarcelona.com

Switzerland
Utilis Müllheim AG
Präzisionswerkzeuge
Kreuzlinger Strasse 22
CH-8555 Müllheim
Phone +41 [0]52. 7626262
Fax +41 [0]52. 7626200
E-mail: info@utilis.com
Internet: www.utilis.com

Netherlands
BIS Specials
[Brandenburg Industry Service Dongen BV]
Dreef 7
6996 BA Drempt
Phone +31 313482566
Fax +31 313482569
E-mail: info@bisspecials.com
Internet: www.bisspecials.com

Poland
BIM Sp.z.o.o.
ul. Wysogotowska 9
62081 Przezmierowo
Phone +48 616232041
Fax +48 616232040
E-mail: bim@bazafirm.pl

Russia
LLC Rosna Engineering
Melnichnaya 4
192019 St. Petersburg
Phone +812 4129213
Fax +812 4125586
E-mail: rosna@rosna.spb.ru
Internet: www.rosna.spb.ru

Slovenia
Elmetool d.o.o.
Prvomajska ulica 62
5000 Nova Gorica
Phone +386 53303300
Fax +386 53303304
E-mail: info@elmetool.si

Sweden
HAINBUCH Svenska AB
Kemistvägen 17
18379 Täby
Phone +46 87327550
Fax +46 87327650
E-mail: hainbuch@hainbuch.se
Internet: www.hainbuch.com

Turkey
Hidkom
Organize Sanayi Bölgesi
75. Yil CD. Demirciler Sit. B Blok No.2
16159 Nilüfer / Bursa
Phone +90 2242438292
Fax +90 2242436365
E-mail: hidkom@tr.net
Internet: www.hidkom.com

10.2.3 America

Brasil
Sanposs Tecnologia, Suprimentos e
Consultoria Internacional Ltda.
Rua Cândia n° 65 - Jardim do Mar
CEP: 09726-220
São Bernardo do Campo - São Paulo
Phone +55 11 41266711
Fax +55 11 41266710
Correo electrónico: tsci@sanposs.com.br
Internet: www.sanposs.com.br

Canada
HAINBUCH America Corp.
Workholding Technology
W129 N10980 Washington Dr.
Germantown, WI 53022
Phone +1 4143589550
Fax +1 4143589560
Correo electrónico:
sales@hainbuchamerica.com
Internet: www.hainbuch.com

Mexico
HAINBUCH America Corp.
Workholding Technology
W129 N10980 Washington Dr.
Germantown, WI 53022
Phone +1 4143589550
Fax +1 4143589560
Correo electrónico:
sales@hainbuchamerica.com
Internet: www.hainbuch.com

Canada
Representative for: Ontario, Québec
J.Winkel & Associates Inc.
6516 Warbler Lane
L5N 6E1 Mississauga, Ontario
Phone +1 4143589550
Fax + 1 4143589560
Correo electrónico:
sales@hainbuchamerica.com
Internet: www.hainbuch.com

USA
HAINBUCH America Corp.
Workholding Technology
W129 N10980 Washington Dr.
Germantown, WI 53022
Phone +1 4143589550
Fax +1 4143589560
Se habla español:
Tel +1 2143268081
Correo electrónico:
sales@hainbuchamerica.com
Internet: www.hainbuch.com

10.2.4 Asia

China
HAINBUCH Shanghai Co. Ltd.
Workholding Technology
1/F, West building
No. 388 East Kangqiao Rd.
Pudong, Shanghai 201319
Phone +86 2120916384
Fax +86 2120916383
E-mail: sales@hainbuch.cn
Internet: www.hainbuch.cn

India
M´la Sales Corporation
5, Yeshwantnagar
Telco-Century Enka Road
411018 Pune
Phone +91 20 27477405
Fax +91 20 27464249
E-mail: info@mla-sales.com
Internet: www.mla-sales.com

India
A.H. Rao
Management & Technology Consultant
Gr.Fl. HNO 4157, 14th Main
HAL 2nd Stage Indiranagar
Bangalore 560 008
Phone +91 25279551
Fax +91 9986997959
E-Mail: ahr.rao@gmail.com

Israel
M.T.M. Machine Tools Marketing Ltd.
31, Harbazel
69710 Tel Aviv
Phone +972 36479560
Fax +972 36479578
E-mail: sales@mtm.co.il
Internet: www.mtm.co.il

Korea
HIOIL E&T Co. Ltd.
160-5, Seokchon-dong, Songpa-gu
Seoul, 138-844
Phone +82 24137911
Fax +82 24137910
E-Mail: inform@hioilent.com
Internet: www.hainbuch.co.kr

Taiwan
GSTC Technology Co., Ltd.
No. 418, Youn-Chun East 1st Rd
Taichung City 40877, Taiwan'
Phone +88 6423805678
Fax +88 6423805511
E-mail: gstc@seed.net.tw
Internet: www.gstctech.com.tw

Indonesia
PT. STAHL ARBEIT
WTC Mangga Dua 2nd Floor A-6
JL. Mangga Dua Raya No. 8
Jakarta 14430
Phone +62 21 3777 6622
Fax. +62 21 3001 8070
E-mail: info@stahl-arbeit.com
Internet: www.stahl-arbeit.com

Japan
NK Works Co LTD
2-17-17 Iwamoto-cho, Chiyoda-ku
Tokyo, 101-0032
Phone +81 338645411
Fax +81 338646752
E-mail: info@nk-works.co.jp
Internet: www.nk-works.co.jp

Malaysia, Singapore & Vietnam
Jebsen & Jessen Technology [S] Pte Ltd.
Process Engineering Division
18 Enterprise Road
Singapur 629824
Phone +65 63053692
Fax +65 63053699
E-mail: phillip_lee@jjsea.com
Internet: www.jjsea.com

Thailand
PTT Precision Tools Co Ltd
HAINBUCH Workholding Solutions
Eastern Seaboard Ind. Est. Micro Fty.
Ph 2 ESIE-Rd 14,
64/93, Moo 4, Tambon Pluak Daeng,
Amphur Pluak Daeng
Rayong 21140
Phone +66 2362 8656
Mobile +66 818384 924
Fax +66 2362 8656
E-mail: anuwat@hb-ptt.com
Internet: www.hainbuch.com

10.2.5 Australia

Australia
Romheld Automation Pty Ltd
Unit 30 115 Woodpark Road
Smithfield . NSW. 2164
Phone +61 297211799
Fax +61 297211766
E-mail: sales@romheld.com.au
Internet: www.romheld.com.au

10.2.6 Africa

South Africa
Retecon [PTY] Ltd.
P.O. Box 1472
1620 Kempton Park
Phone +27 119768600
Fax +27 113942471
E-mail: tools@retecon.co.za
Internet: www.retecon.co.za

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HAINBUCH SPANNENDE TECHNIK

HAINBUCH GMBH
SPANNENDE TECHNIK
PO Box 1262 · DE-71667 Marbach
Erdmannhäuser Straße 57 · DE-71672 Marbach
Phone +49 [0]7144. 907-0
Fax +49 [0]7144. 18826
verkauf@hainbuch.de
www.hainbuch.com
24h-Emergency call +49 [0]7144. 907-444

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